Plant Pathology Circular No, 193 Fla. Dept. Agric. and Consumer Services
October 1978 Division of Plant Industry

DOWNY MILDEW OF GRAPE

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Downy mildew of grape, caused by the fungus Plasmopara viticola (B. & C.) Berl. and Det., is undoubtedly native to the United States (1). It was probably indigenous on the wild grapes along the east coast and then spread to the vineyards cultivated by the colonists. It was first described from this country as early as 1836. The disease is of general occurrence in the United States east of the Rocky fountains and may cause serious losses if rainfall is unusually heavy at critical periods of growth. If the disease occurs early in the season, entire bunches of young fruit may be killed, and 50 to 75 percent of the crop may be destroyed where no fungicides are used (1).

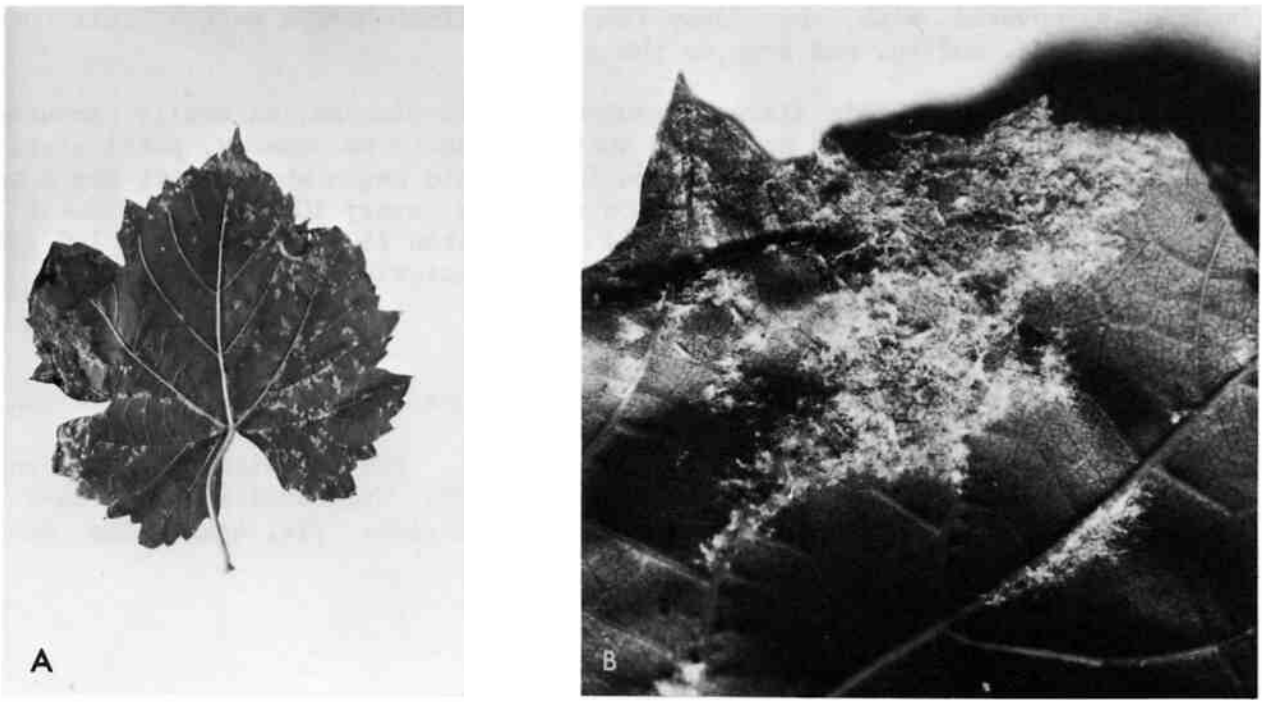

Fig. 1. Downy mildew on grape leaves. A. Underside of leaves showing white spotting. B. Close-up showing the characteristic downy white fungus mycelium.

In the early 1870s, the French vineyards were suffering from the effects of the grape Phylloxera, an insect introduced into Europe from America. It was found that rootstocks of the American species were more resistant to this insect than was the European vinifera species; consequently, the American species were introduced into Europe. Along with them, downy mildew was also introduced. The European vinifera grapes were much more susceptible to the disease than the American rootstocks, and it soon became a threat to grape culture throughout the humid area of Europe.

Contribution No. 454, Bureau of Plant Pathology, P. O. Box 1269, Gainesville, FL 32602.

At this time, French research workers began many investigations on the disease. Perhaps the most significant was the accidental discovery of a fungicide for the control of the disease. Growers in one region of France were in the habit of sprinkling their vines bordering the roads with a mixture of copper sulfate and lime to make the grapes unattractive to passers-by who often picked the fruit. It was noted that these vines remained healthy whereas those farther from the road were defoliated by downy mildew. Investigations following this observation gave rise to the fungicide Bordeaux mixture.

SYMPTOMS. Downy mildew is found worldwide where grapes are grown under humid weather conditions. It is more destructive to the European varieties than to the American varieties derived from native species. Certain hybrids of the American and European species lack resistance (1). It attacks both the berries and the succulent green parts of the vine. It first appears as irregular, indefinitely edged, yellow-green spots on the upper leaf surface (3). These spots later turn brown and their undersurface becomes covered with a downy white growth of the fungus mycelium (Fig. 1). On shoots, the lesions are first water-soaked but later become covered with the fungus. Young fruits are frequently covered with the downy fungus mycelium whereas mature fruit turn purple or brown, soften, and drop to the ground.

CONTROL. Control of this disease requires a well-planned, carefully executed spray program (2). All leaf and fruit surfaces should be covered, particularly during the bloom period. Spray applications should begin when shoots are 2 to 4 inches (5 to 10 cm) long and should be repeated every 10 to 14 days until 7 to 10 days before harvest. Captan (50%) or Phaltan (50%) at 2 lb per 100 gal (0.9 kg per 378.5 liters) per acre are suggested materials.

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